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(54) **Wiper blade assembly structure**

(57) The wiper blade assembly structure according to the present invention comprises a main arm (200) which operates by a driving force supplied by a wiper motor; a support frame (30) which is connected to the main arm (200) and receives the driving force from the main arm (200) and has a space unit (31) formed in a certain size in an upper central part thereof and a lower coupling member formed in the space unit to be coupled to a replaceable adaptor (60); a replaceable adaptor (60) which is detachably attached to the space unit (31) of the support frame (30) by a fixing means using the fixing pin and couples the main arm (200) to the support frame (30); a blade fixer (20) which is coupled to a lower part

of the support frame (30); a blade (10) which is coupled to the blade fixer (20); and the replaceable adaptor (60) having a coupling part formed in a central part thereof to be detachably coupled to a front end coupling part of the main arm (200), and having an upper coupling member formed in a lower part thereof corresponding to the lower coupling member of the support frame (30), and having a size to be inserted into an inside of the space unit (31) of the support frame (30). The wiper blade assembly according to the present invention connects various types of wiper main arms to a single blade assembly to thereby improve utilization of the wiper and saves manufacturing costs.

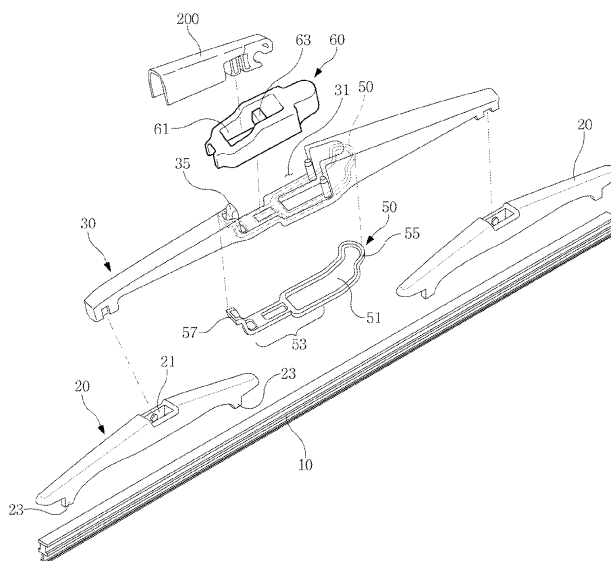


Fig. 2A

Description

[Technical Field]

[0001] The present invention relates to a wiper blade assembly structure, and more particularly, to a wiper blade assembly structure which has a space unit formed in a certain area of a support frame, to which a main arm of a wiper is coupled, and allows a replaceable adaptor to be detachably attached to the space unit to thereby enable various types of main arms to be coupled to a single support frame together with the replaceable adaptor.

[Background Art]

[0002] Generally a windshield wiper of automobiles is used to wipe off rain, snow or dirt or insects from a windshield for ensuring a driver's field of vision when it rains or snows while driving. The windshield wiper is an essential device for reducing occurrence of car accidents and securing safety of drivers while driving.

[0003] The windshield wiper includes a main arm operating by a driving force supplied by a wiper motor, a support frame connected to the main arm and receiving the driving force therefrom and a wiper blade including a coupling groove coupled to the support frame. The wiper blade is closely adhered to the windshield and operates by the driving force transmitted from the main arm through the support frame to thereby remove dirt from the windshield.

[0004] In the wiper structure above, the wiper blade should operate by being closely adhered to the windshield to remove the dirt from the windshield. Accordingly, the main arm and the support frame are coupled to each other with the configuration to apply force so that the wiper blade is closely adhered to the windshield. Recently, additional devices are mounted in the automobile to increase the adherence of the wiper blade to the windshield to thereby prevent separation between the wiper blade and the windshield which may arise by air resistance or inertial force while driving.

[0005] Such wiper blade operates by directly contacting the windshield and generally includes a soft rubber to protect the windshield. As above, as the wiper blade is closely adhered to the windshield, it is worn heavily by friction with the windshield, and is exposed to snow or rain and corrosion and crack may occur easily. Accordingly, the wiper blade should have such structure that a user may easily replace.

[0006] In the conventional wiper, the support frame varies depending on the specifications of the wiper main arm coupled to the support frame of the blade assembly structure, which causes inconvenience and unnecessary consumption of materials. That is, if the structure of the main arm varies depending on the type of automobiles, the wiper support frame coupled to the main arm should also be replaced accordingly. This causes inconvenience

in use and raises costs due to waste of materials.

[0007] The conventional wiper support frame is thick and includes a plastic material and weighs much.

5 [Disclosure]

[Technical Problem]

[0008] The present invention has been made to solve the problems and it is an object of the present invention to provide a wiper blade assembly structure which has a space unit formed in a certain area of a support frame, to which a main arm of a wiper is coupled, and allows a replaceable adaptor to be detachably attached to the space unit to thereby enable various types of main arms to be coupled to a single support frame together with the replaceable adaptor.

[Technical Solution]

[0009] In order to achieve the object of the present invention, a wiper blade assembly structure comprises a main arm which operates by a driving force supplied by a wiper motor; a support frame which is connected to the main arm and receives the driving force from the main arm and has a space unit formed in a certain size in an upper central part thereof and a lower coupling member formed in the space unit to be coupled to a replaceable adaptor; a replaceable adaptor which is detachably attached to the space unit of the support frame by a fixing means using the fixing pin and couples the main arm to the support frame; a blade fixer which is coupled to a lower part of the support frame; a blade which is coupled to the blade fixer; and the replaceable adaptor having a coupling part formed in a central part thereof to be detachably coupled to a front end coupling part of the main arm, and having a fixing pin inserting hole formed in a lower part thereof, into which the fixing pin of the support frame is inserted, and having a size to be inserted into an inside of the space unit of the support frame.

[0010] The fixing means comprises at least one fixing pin to fix the replaceable adaptor in a vertical direction, and a hook member to fix the replaceable adaptor to the space unit of the support frame.

[0011] The replaceable adaptor according to the present invention has a coupling part formed in a central part thereof to be detachably coupled to a front end coupling part of the main arm, and an upper coupling member corresponding to the lower coupling member formed in a lower side thereof, and has a size to be inserted into the inside of the space unit of the support frame.

[0012] The lower coupling member of the support frame comprises at least one fixing pin to fix the replaceable adaptor in a vertical direction and a hook member which fixes the replaceable adaptor to the space unit of the support frame.

[0013] The replaceable adaptor according to the present invention is replaced by other types of replace-

able adaptors to be coupled to each main arm, depending on the type of the main arm.

[0014] An insert reinforcing frame is installed in a internal lower side of the part where the replaceable adaptor of the support frame is installed and reinforces the strength of the support frame.

[0015] The insert reinforcing frame comprises a steel material, and is formed in a longer length than the space unit of the support frame.

[Advantageous Effect]

[0016] As described above, the wiper blade assembly according to the present invention maintains consistent strength, and at the same time, connects various types of wiper main arms to a single blade assembly to thereby improve utilization and saves manufacturing costs since the wiper blade assembly does not need to vary depending on the type of the wiper main arm.

[Brief Description of Drawings]

[0017] FIG. 1 is a perspective view of a wiper blade assembly and a front end part of a main arm coupled to the wiper blade assembly according to the present invention.

[0018] FIG. 2A is an exploded perspective view of the wiper blade assembly and the main arm in FIG. 1.

[0019] FIG. 2B is a front view of the wiper blade assembly and the main arm in FIG. 1.

[0020] FIG. 3 is an enlarged perspective view of a replaceable adaptor coupled to a space unit of a support frame according to the present invention.

[0021] FIG. 4A is a perspective view of various types of replaceable adaptors coupled to the space unit of the support frame according to the present invention.

[0022] FIG. 4B is a perspective view of a front end structure of the main arm coupled to each replaceable adaptor in FIG. 4A.

[Best Mode]

[0023] Hereinafter, a wiper blade assembly structure according to the present invention will be described with reference to accompanying drawings.

[0024] FIG. 1 is a perspective view of a wiper blade assembly and a front end part of a main arm coupled to the wiper blade assembly according to the present invention. FIG. 2A is an exploded perspective view of the wiper blade assembly and the main arm in FIG. 1. FIG. 2B is a front view of the wiper blade assembly and the main arm in FIG. 2A.

[0025] FIG. 3 is an enlarged perspective view of a replaceable adaptor coupled to a space unit of a support frame according to the present invention.

[0026] Referring to FIGS. 1 to 3, the wiper blade assembly structure according to the present invention includes a blade assembly 100 having a wiper blade 10

attached to a lower part thereof and a replaceable adaptor 60 coupled to an upper part thereof; and a main arm 200 whose front end coupling part is coupled to the replaceable adaptor 60 of the blade assembly 100.

[0027] With the foregoing configuration, the main arm 200 of the wiper operates by the driving force directly supplied by a wiper motor (not shown). The wiper blade assembly 100 includes a support frame 30 which is connected to the main arm 200 to receive the driving force therefrom, has a space unit 31 (refer to FIG. 2A) formed in a certain size in an upper central part thereof and a lower coupling member formed in a lower surface thereof to be coupled to a replaceable adaptor 60; the replaceable adaptor 60 which is detachably attached to the space unit 31 of the support frame 30 by a fixing means and couples the main arm 200 to the support frame 30; a blade fixer 20 which is coupled to a lower part of the support frame 30 and a blade 10 which is coupled to the blade fixer 30.

[0028] The support frame 30 according to the present invention has the space unit 31 formed in a certain area of the upper part, e.g., in a central part thereof in a certain size, and the replaceable adaptor 60 is detachably attached to the space unit 31.

[0029] As a certain part of the support frame 30 should be cut off to form the space unit 31 in the support frame 10, the weight of the support frame 30 is reduced in proportion to the cut-off area.

[0030] However, in inverse proportion to the reduced weight of the support frame 30, the strength of the support frame 30 is weaker and an insert reinforcing frame is additionally installed in an internal lower part of the support frame 30. The insert reinforcing frame 50 preferably includes a thin steel material, which may reinforce the strength of the support frame 30 by using the thin strong steel while the thickness of the support frame 30 is thin.

[0031] Accordingly, at the time of injection molding, the insert reinforcing frame 50 is molded while being inserted into the support frame 30. The insert reinforcing frame 50 is provided in a lower part of an insertion space unit 31 into which the replaceable adaptor 60 is inserted, on the support frame, and is formed in a longer length than the space unit 31 to thereby reinforce the strength of the support frame 30.

[0032] In consideration of the foregoing, the insert reinforcing frame 50 has the space unit 51 formed in a certain part thereof, and a certain length of a central part 53 is flat to have the same configuration as that of the support frame 30, and opposite ends 55 and 57 are bent and project upwardly compared to the central part 53 as shown in FIG. 2A.

[0033] The replaceable adaptor 60 has a coupling part formed in a central part thereof to be detachably coupled to a front end coupling part of the main arm, and an upper coupling member corresponding to the lower coupling member formed in a lower side thereof, and has a size to be inserted into the inside of the space unit of the support frame.

[0034] As shown in FIGS. 2B and 3, the lower coupling member of the support frame 30 includes at least one of fixing pins 34a, 34b and 34c to fit and fixe the replaceable adaptor 60 in a vertical direction and a hook member 35 to fix the replaceable adaptor 60 to the support frame 30 concurrently with the replaceable adaptor 60 downwardly inserted into the space unit 31 of the support frame 30.

[0035] The lower coupling member of the support frame 30 may be formed as a coupling member in a different type from the fixing pins 34a, 34b and 34c in one side wall of the space unit 31 of the support frame 30. The upper and lower coupling members may be formed to be vertically engaged with each other unlike the foregoing configuration.

[0036] Accordingly, the replaceable adaptor 60 according to the present invention should be replaced to other types of replaceable adaptors (refer to FIG. 4A) to be coupled to each main arm, depending on the type of the main arm (refer to FIG. 4B).

[0037] The fixing pins 34a, 34b and 34c formed as an example of the lower coupling member in the support frame 30 are inserted into insertion grooves 61a, 61b and 61c formed in a lower side of the replaceable adaptor 60.

[0038] The hook member 35 has an inclination surface 35a (refer to FIG. 2B) formed in an upper part thereof, and is pushed back when the replaceable adaptor 60 moves downward, and projects forward concurrently with the completion of the insertion of the replaceable adaptor 60 to thereby fix the replaceable adaptor 60 inserted into the space unit 31 of the support frame 30.

[0039] To detach the replaceable adaptor 60 from the space unit 31 of the support frame 30, the hook member 35 is pulled back and the replaceable adaptor 60 is held upward. Then, the replaceable adaptor 60 is detached from the support frame 30.

[0040] The fixing means of the replaceable adaptor 60 may have a different configuration from that described above. Not only the replaceable adaptor 60 with the foregoing configuration, but also other shapes of replaceable adaptors with different configurations may be coupled to the support frame 30. That is, if a coupling means is formed in a lower part of the replaceable adaptor with the different configuration corresponding to the fixing means of the replaceable adaptor according to the present exemplary embodiment, the replaceable adaptor may be coupled to the support frame 30.

[0041] Accordingly, the space unit 31 of the support frame 30 according to the present invention has a configuration to accommodate various types of replaceable adaptors, e.g., replaceable adaptors 60a, 60b and 60c as shown in FIG. 4A, in addition to the replaceable adaptor 60 according to the present exemplary embodiment.

[0042] The blade fixer 20 according to the present invention has the blade 10 attached to a lower part thereof. A conventional normal blade fixer having the blade 10 mounted in a lower part thereof is applicable and thus detailed description will be omitted.

[0043] The replaceable adaptor 60 according to the

present invention has a coupling part 61 formed in a central part thereof to be detachably coupled to a front end part of the main arm 20, and has fixing pin inserting holes 61a, 61b and 61c (refer to FIG. 3), formed in a lower part thereof, into which the fixing pins 34a, 34b and 34c of the support frame 30 are inserted and having a size to be inserted into the inside of the space unit 31 of the support frame 30.

[0044] In the case of coupling with the main arm 20 provided in an upper part, a front end coupling part 210 (refer to FIG. 2B) of the main arm 200 is inserted into the coupling part 61 of the replaceable adaptor 60. For example, a fixing shaft inserting groove 211 of the main arm 200 is coupled to a fixing shaft 63 (refer to FIG. 2A) provided in the inside of the coupling part 61 of the replaceable adaptor 60, and the fixing shaft inserting groove 211 is rounded inwardly and surrounds the fixing shaft 63 provided in the replaceable adaptor 60.

[0045] In the replaceable adaptor 60 according to the present invention, a hook member coupling part 65 formed in a side of the replaceable adaptor 60 is coupled to the hook member 35 and has an appropriate thickness according to the size of the hook member 35.

[0046] The shape of the replaceable adaptor 60 according to the present invention is not limited to that according to the present exemplary embodiment, and may vary. Also, the configuration of the front end coupling part 210 of the main arm 200 coupled to the replaceable adaptor 60 may vary accordingly.

[0047] The configuration of connecting the main arm 200 to the coupling part 61 provided in the replaceable adaptor 60 according to the present invention may be embodied by the conventional art, and detailed description will be omitted.

[0048] Hereinafter, a process of installing the replaceable adaptor 60 according to the present invention in the space unit 31 of the support frame 30 will be described with reference to FIGS. 2A, 2B and 3.

[0049] As shown in FIGS. 2A, 2B and 3, the replaceable adaptor 60 according to the present invention is located in an upper part of the space unit 31 of the support frame 30 to couple the replaceable adaptor 60 to the space unit 31 formed in the support frame 30. The fixing pins 34a, 34b and 34c formed in a lower surface 33 of the space unit 31 of the support frame 30 are inserted into the fixing pin inserting holes 61a, 61b and 61c provided in the lower part of the replaceable adaptor 60.

[0050] When the fixing pins 34a, 34b and 34c are inserted into the inside of the replaceable adaptor 60, the hook member 25 is pulled back, and projects forward concurrently with the completion of the insertion of the replaceable adaptor 60 and the replaceable adaptor 60 is locked while being inserted. An upper step (not shown) of the hook member 35 in the above state is located in the hook member coupling part 65 refer to FIG. 2B) of the replaceable adaptor 60.

[0051] The inclination surface 35a is formed in an upper part of the hook member 35 and enables the replace-

able adaptor 60 to be easily inserted into the space unit 31 of the support frame 30.

[0052] FIGS. 4A and 4B illustrate various types of replaceable adaptors according to exemplary embodiments of the present invention and a configuration of the front end coupling part of the main arm coupled to the coupling part of the replaceable adaptors.

[0053] That is, FIG. 4A is a perspective view of the various types of the replaceable adaptors coupled to the space unit of the support frame according to the present invention. FIG. 4B illustrates a configuration of the front end coupling part of the main arm coupled to the replaceable adaptors in FIG. 4A.

[0054] As shown therein, the replaceable adaptors 60, 60a, 60b and 60c in FIG. 4A have different shapes, and may be detachably attached to the same support frame 30. Accordingly, the shape of the front end coupling part of the main arms 200, 200a, 200b and 200c coupled to the replaceable adaptors 60, 60a, 60b and 60c varies.

[0055] As described above, the wiper blade assembly structure according to the present invention has the space unit formed in the certain area of the support frame coupled to the main arm of the wiper, and has the replaceable adaptor detachably attached to the space unit to thereby couple various types of main arms to a single support frame. The wiper blade assembly according to the present invention connects various types of wiper main arms to a single blade assembly to thereby improve utilization of the wiper and saves manufacturing costs.

[0056] <Description of Reference Numerals>

10: blade 20: blade fixer

30: support frame 31: space unit

33: space unit lower surface 34a, 34b, and 34c: fixing pins

35: hook member 35a: upper inclination surface

50: insert reinforcing frame 51: reinforcing frame space unit

53: reinforcing frame central part 55 and 57: opposite ends

60: replaceable adaptor 61: main arm coupling part 61a, 61b and 61c: fixing pin inserting holes 63: fixing shaft

65: hook member coupling part 100: wiper blade assembly

200: wiper main arm 210: main arm front end coupling part

211: fixing shaft inserting groove

Claims

1. A wiper blade assembly structure comprising:

a main arm which operates by a driving force supplied by a wiper motor;

a support frame which is connected to the main arm and receives the driving force from the main

arm and has a space unit formed in a certain size in an upper central part thereof and a lower coupling member formed in the space unit to be coupled to a replaceable adaptor;

a replaceable adaptor which is detachably attached to the space unit of the support frame by a fixing means using the fixing pin and couples the main arm to the support frame;

a blade fixer which is coupled to a lower part of the support frame;

a blade which is coupled to the blade fixer; and the replaceable adaptor having a coupling part formed in a central part thereof to be detachably coupled to a front end coupling part of the main arm, and having an upper coupling member formed in a lower part thereof corresponding to the lower coupling member of the support frame, and having a size to be inserted into an inside of the space unit of the support frame.

2. The wiper blade assembly structure according to claim 1, wherein the lower coupling member of the support frame comprises at least one fixing pin to fix the replaceable adaptor in a vertical direction, and a hook member to fix the replaceable adaptor to the space unit of the support frame.

3. The wiper blade assembly structure according to claim 1, wherein the replaceable adaptor is replaced by other types of replaceable adaptors to be coupled to each main arm, depending on the type of the main arm.

4. The wiper blade assembly structure according to claim 1, wherein an insert reinforcing frame is installed in a internal lower side of the part where the replaceable adaptor of the support frame is installed.

5. The wiper blade assembly structure according to claim 1, wherein the insert reinforcing frame comprises a steel material, and is formed in a longer length than the space unit of the support frame.

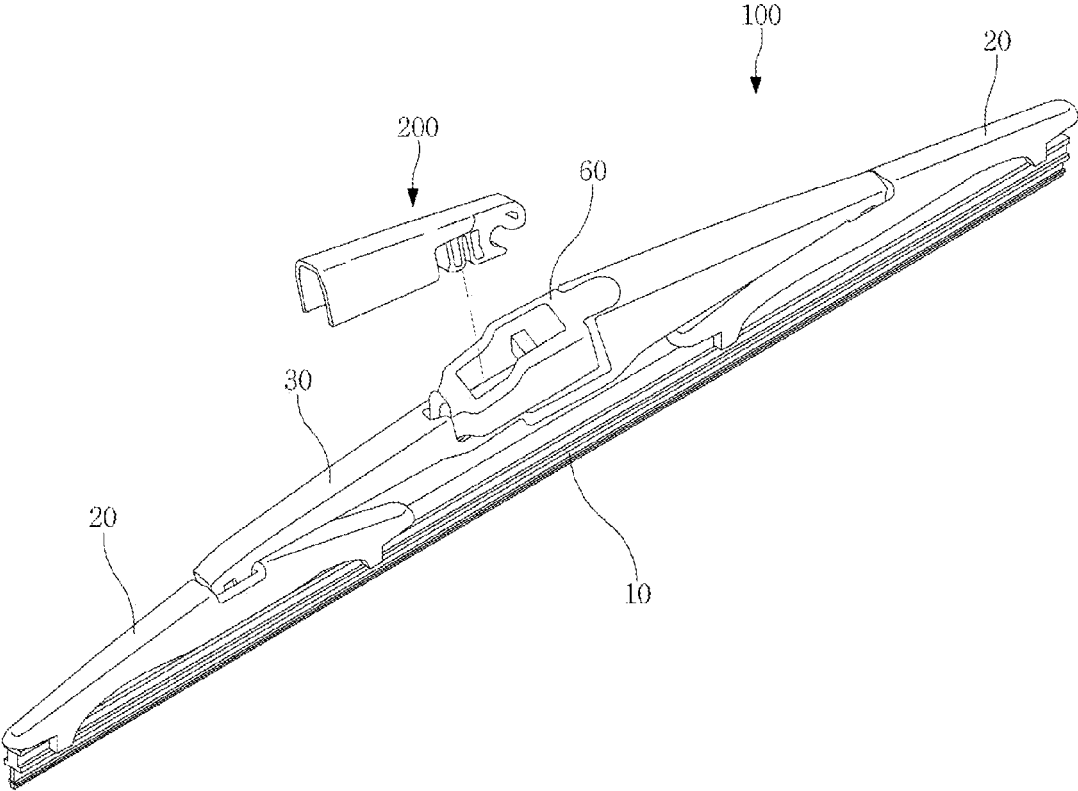


Fig. 1

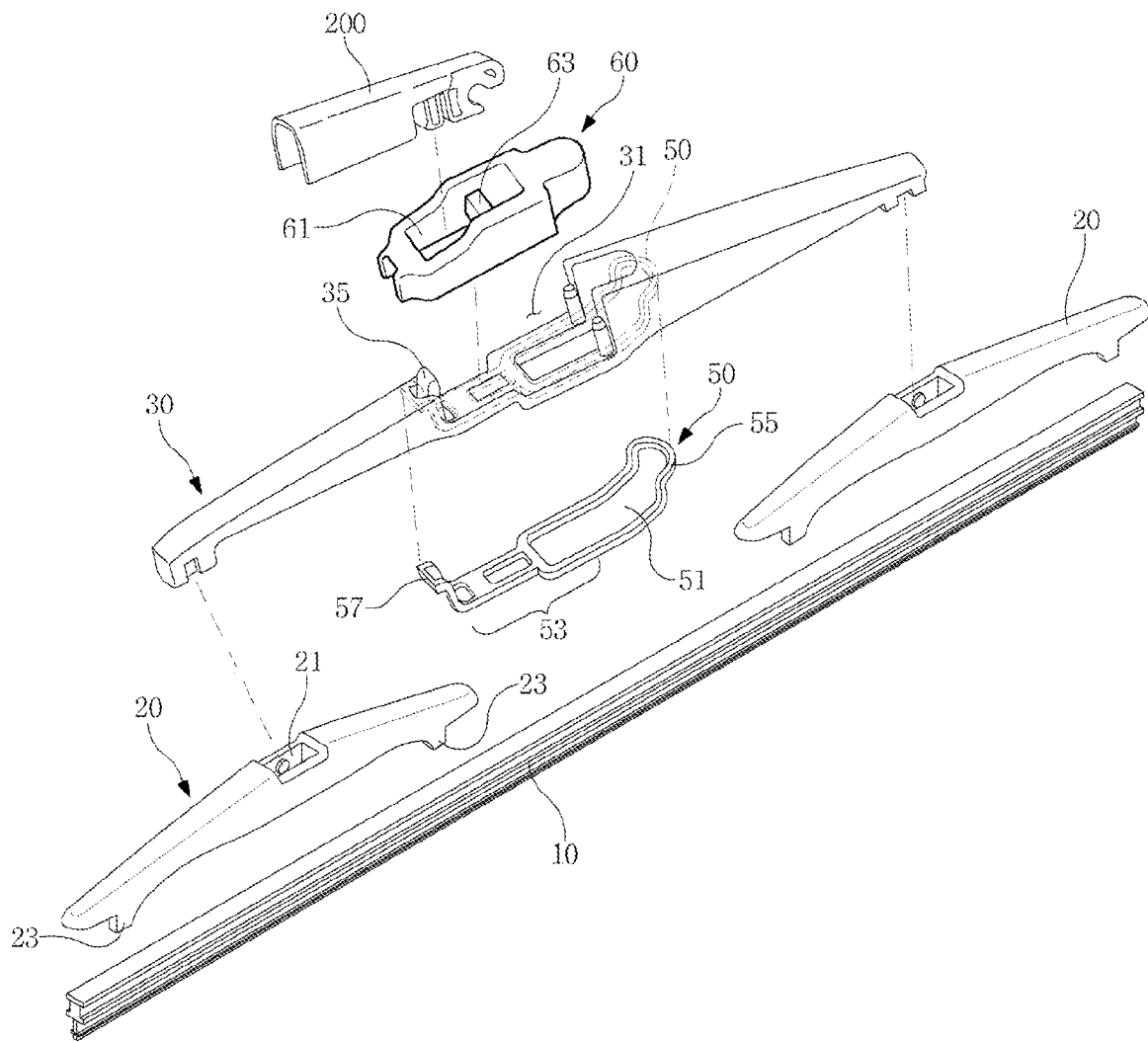


Fig. 2A

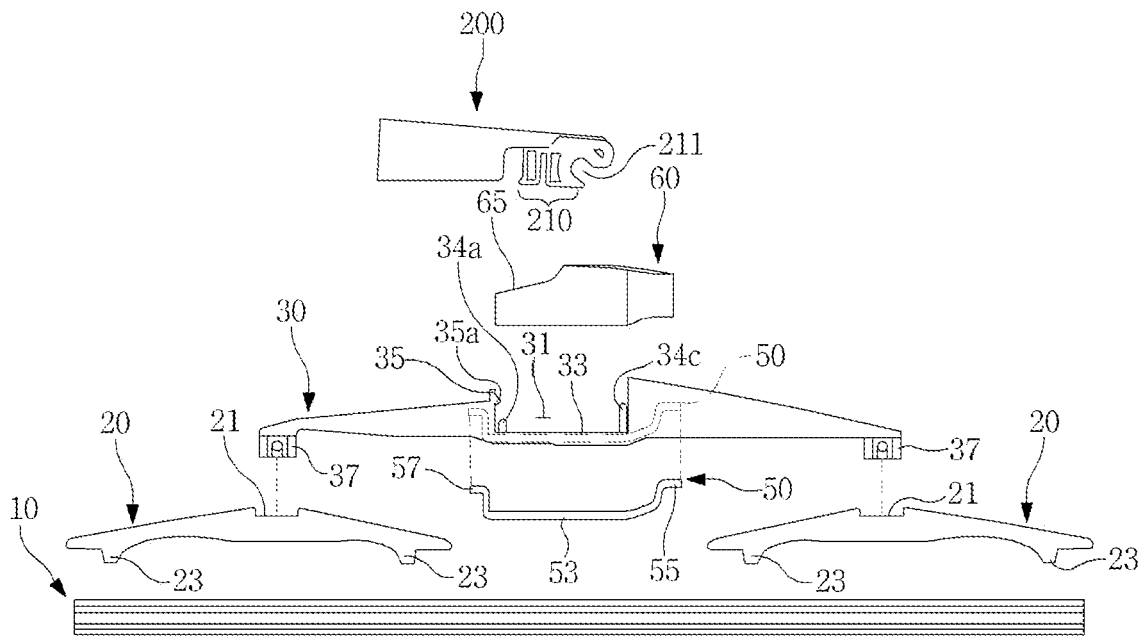


Fig. 2B

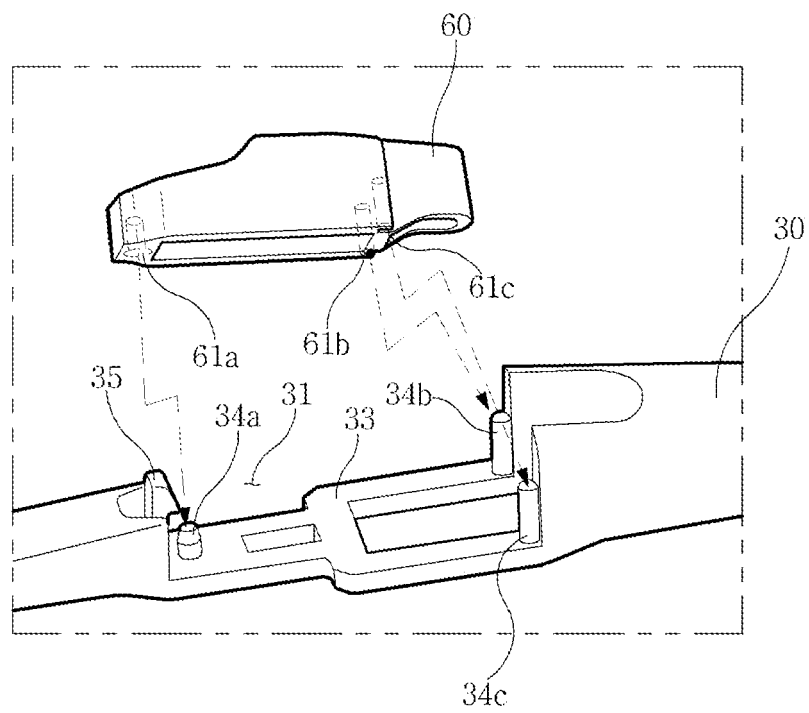


Fig. 3

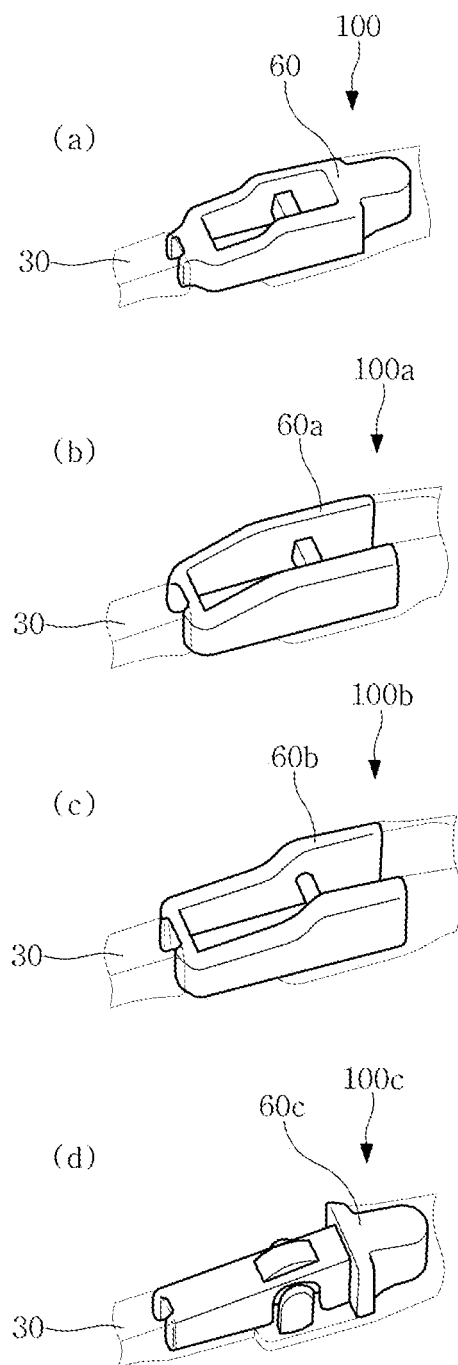


Fig. 4A

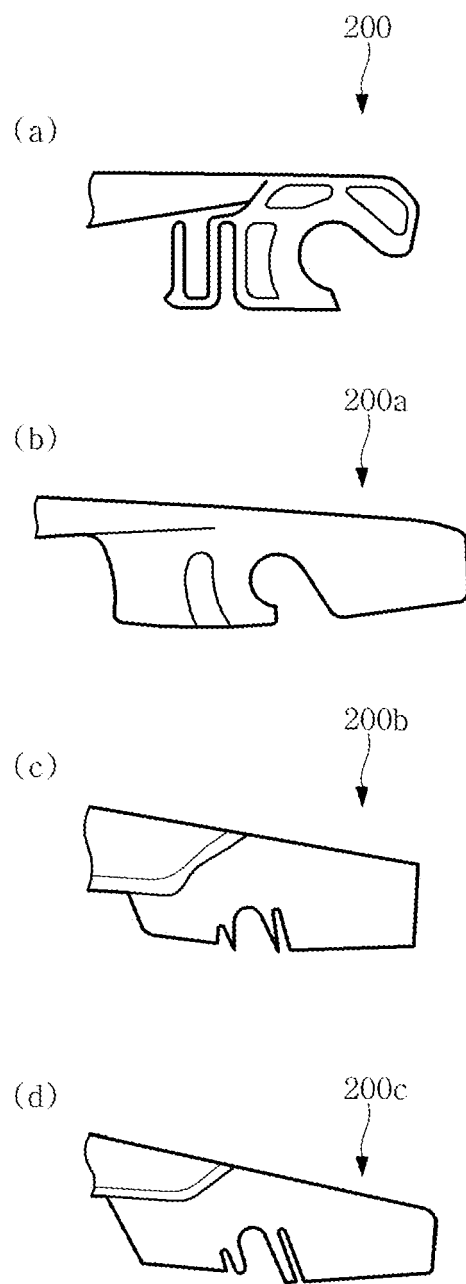


Fig. 4B